

## NEW SOUTHWESTERN BOMBYLIIDAE (DIPTERA)<sup>1</sup>

Jack C. Hall<sup>2</sup>

**ABSTRACT:** One new genus, *Paradiplocampta* and one new subgenus of *Villa*, (*Diochanthrax*) are described. The following new species are described *V. (D.) morulus*, *V. (Thyridanthrax) melanoptera*, *P. tabeti*, *Parabombylius rutilous* and *Amphicosmus arizonicus*. All of the new forms are from the southwestern United States.

**DESCRIPTORS:** Diptera: Bombyliidae: *Paradiplocampta* n. gen., *Diochanthrax* n. subgen., *Paradiplocampta tabeti* n. sp., *Villa (Diochanthrax) morulus* n. sp., *Villa (Thyridanthrax) melanoptera* n. sp., *Parabombylius rutilous* n. sp., *Amphicosmus arizonicus* n. sp.

As stated in previous articles the southwestern United States is especially rich in Bombyliidae and as a consequence more and more attention is being paid to this family. The following species are therefore being described at this time in order to make the names available for other studies and also to return borrowed material. The new forms described herein were all collected in southern California and Arizona.

### *Villa (Thyridanthrax) melanoptera*, n. sp.

This species is atypical of *Thyridanthrax* and somewhat bridges the gap between *Thyridanthrax* and *Poecilanthrax*. Were it not for the scales on the face and front *melanoptera* would on the basis of the male genitalia be considered an "aberrant" *Poecilanthrax*. On the other hand, many characteristics such as the fenestrate wing, wing venation, size and general habitus preclude placing it anywhere but in *Thyridanthrax*. There are many specimens before me and they express surprisingly little variation, even between the sexes.

**Male.** — Black, legs brown to testaceous, as is side of face and oral margin. Eyes separated by three times width of small ocellar tubercle. Front with coarse black hair, a bare horizontal depression in middle; tomentum of scattered pale yellowish scales. Basal antennal segments with black hair; first segment, in lateral view about one and one half times longer than widest portion; second segment rounded, about as wide as long; third

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<sup>2</sup> Department of Entomology, Division of Biological Control, University of California, Riverside 92502

segment long, base elongate conical, apical styliform portion about equal in length to conical base, terminating in a small arista. Face strongly and acutely projecting with black hair and pale yellow scales. Proboscis not projecting, with narrow pointed labellae. Palpi black with black hair. Occipital tomentum pale yellowish, black, short, scattered hair on side becoming yellowish above; cervical fringe yellowish-white. Mesonotum short black pilose, hair longer laterally, that on collar and lateral margin in front of wing base whitish; tomentum pale yellowish, scattered; bristles black. Pleura with mixed black and pale yellow hair, fan-shaped tuft of black and pale hair on metapleuron in front of halter; tomentum on pleura shining yellowish. Prosternum, coxae and legs with black hair; coxae with shining testaceous scales; scales on femora black to brown; fore tibia smooth, others with black bristles. Halter stem and knob black with apex of both whitish. Squama brown with fringe of testaceous scales. Scutellum black pilose, tomentum pale yellowish, spot of black scales in middle; bristles black. Basicosta with whitish hair, black scales and setulae. Wing infuscated dark brown, hyaline spots surrounding r-m and posterior crossveins and at base of  $R_4$ , upper basal corner of third posterior cell, other hyaline areas in middle of apical portion of marginal cell, middle and apical portion of first submarginal, posterior portion of second submarginal, middle of discal and all posterior cells, color extends along posterior margin of wing from first posterior cell to base of wing, anal and axillary cells entirely colored; discal cell broadened apically; alula well developed. Abdominal dorsum with pale yellow hair, white hair on first segment, black hair on apical segments, lateral margin with white hair at base, rest entirely black haired; tomentum on dorsum black, white and pale yellow, black in middle of segments two to five decreasing in amount posteriorly, patch of white scales on side of segments three to five, segment six entirely white tomentose, yellowish scales elsewhere on abdomen particularly noticeable at side of second segment. Venter black pilose, yellowish tomentose laterally, black tomentum medially. Genitalia testaceous with black hair; epandrium short, posterior margin truncate; epiphallus straight, broad, apex in dorsal view rounded, in lateral view rounded above, flat below; aedeagus short, broad, straight not projecting beyond tip of epiphallus with a small notch near base on upper margin; basistylus broad basally tapering to bluntly pointed apex; dististyli small rather flattened, conical, curved posteriorly, not hooked apically.

**Female.** — Not unlike the male, pale tomentum more white than yellowish and more dense, otherwise nearly identical to male.

In some specimens the yellowish scales on the abdomen are completely wanting being replaced with white scales. When the wings are light brown in color, rather than dark brown, all the cells in the wing have their centers hyaline to subhyaline. Some specimens have black hair on the posterior margin of all the abdominal segments. Some specimens, especially females, will have the face and first antennal segment nearly entirely fulvous.

This is a spring and early summer species found primarily in the desert regions of California and Arizona. It ranges from California south to Arizona and east to Texas.

**Holotype male, allotype female** from 8 mi. E. Lancaster, Los Angeles Co., California, IV-30-66 (J.C. Hall). Both in California Academy of Sciences, San Francisco.

**Paratypes:** California: 3♂, 1♀ topotypic, collected with types (J.C. Hall, F.G. Andrews). San Bernardino Co.: 1♀ Victorville, V-5-56 (J. Powell); 1♂, 1♀ 15 mi. N. Baker, IV-15-66 (F.G. Andrews); 1♀ 5 mi. N. Baker, III-24-53 (J.W. MacSwain); 1♂, 1♀ Silver Lake, IV-20-69 (F.G. Andrews); 7♂ 20 mi. S.W. Baker, IV-15-66 (F.G. Andrews); 5♂ 13 mi. S. Shoshone, III-16-66 (F.G. Andrews); 1♀ 20 mi. S. Kelso, IV-30-66 (P.H. Timberlake); 3♂ Granite Pass, IV-27-68, 3800-4320 ft. (E.I. Schlinger). Kern Co.: 1♀ Rosamond, IV-23-54 (T.R. Haig). Inyo Co.: 1♀ Independence, IV-29-59 (R.P. Allen). Riverside Co.: 3♂, 1♀ Palm Desert, IV-8-58, IV-22-58 (H.R. Moffitt, J.C. Hall); 1♂, 1♀ Palm Springs, IV-5-48, IV-21-64 (J.W. MacSwain); 2♂ Corn Springs, Chuckwalla Mts., III-28-69 (J.C. Hall); 1♂, 1,000 Palms, III-20-63 (W.H. Ewart); 2♂, 1♀, McCoy Springs, IV-8-63 (J.C. Hall); 2♀ Cottonwood Springs, IV-5-66 (P.H. Timberlake, J.C. Hall); 1♀ Box Canyon, IV-5-66 (F.G. Andrews); 1♂, 1♀ Desert Center, IV-5-58 (F. Colley); 1♂ Palm Springs Sta., III-26-60 (M. Wasbauer) on *Encelia farinosa*; 27♂♀ Deep Canyon, vicinity of lab., IV-3 to IV-10-73 (A.B. Tabet) on *Chenactis fremonti*; 1♀ Coyote Creek, IV-17-74 (Suzy Frommer). Merced Co: 1♂ Raymond, IV-4-47 (H. Welsh). San Diego Co: 1♂ Borrego Valley, III-26-59 (L.M. Smith); 1♀ Plum Canyon, Anza St. Park, IV-5-59 (E.I. Schlinger). Imperial Co.: 1♀ 10 mi. N. Glamis, IV-1-73 (G.R. Ballmer); 1♂, 1♀ Ocotillo, III-21-66 (J.C. Hall, P.H. Timberlake). Nevada, Clark Co.: 1♀ Lake Mead, IV-18-49 (G.E. Bohart). Arizona, Pinal Co.: 3♂, 7♀ Florence Jct., IV-5-54 (T.R. Haig). Yuma Co.: 1♂ 7 mi. E. Tacna, III-23-74 (T. Plichta). Texas, El Paso Co.: 2♂, 1♀ El Paso, IV-28-27 (J.O. Martin).

### *Villa (Diochanthrax), n. subgen.*

In present keys this group runs to *Villa (Chrysanthrax)* or *Stonyx*. It differs from both by the shape of the head, the bulbous *Anthrax*-like third antennal segment, the absence of femoral bristles, smooth front tibia, three submarginal cells in the wing and an undeveloped alula. *Diochanthrax* is possibly most closely related to *Stonyx* but the proboscis doesn't project and the fore tibiae are smooth.

### *Villa (Diochanthrax) morulus, n. sp.*

**Male.** — Body 5-8 mm. long, wing 6-8 mm. long. Black, legs testaceous, especially tibiae. Front with black hair, spot on each side in middle of denser black hair making two darker spots, tomentum black with light reflections, a small patch of lighter scales above and to side of antennal base. Antennae short, third segment longer than two basal segments combined, first segment at least three times longer than second, both basal segments with black hair, base of third segment globular, abruptly tapering to apical styliform portion which is nearly twice as long as basal portion. Face conically but not acutely projecting, with black hair, black tomentum in middle, lighter toward eye. Proboscis short, not projecting, labellae narrow. Palpi brownish with black hair. Occiput with black setulae and pale scales, vertex behind ocellar tubercle deeply foveate; cervical fringe black. Mesonotum with long, thin, scattered, black hair, collar with denser white hair, whitish tomentum overall, denser along lateral margin; tuft of white hair below post-alar callus; bristles long, thin, black. Pleura mixed black and yellowish pilose, yellow tomentum on mesopleuron, propleuron entirely black haired; metapleural fringe mixed

black and yellowish. Prosternum and legs with black hair, hind coxa with a few yellowish hairs; all femora with black tomentum, a few yellowish scales on posterior surface of hind femur; femora with long, abundant, black hair, bristles wanting; fore tibia smooth, mid and hind tibiae with black tomentum and bristles; claws on fore leg about half length of claws on other legs. Halter stem and knob black. Squama black with yellowish fringe. Scutellum with thinly scattered black hair, white sparse tomentum, spot of black tomentum in middle at base; bristles long, thin, hair-like, black. Basicosta black with yellowish hair at base. Upper basal half of wing entirely infuscated, apical half mottled, all veins in apical half of wing broadly bordered with black; three submarginal cells; r-m crossvein well beyond middle of discal cell; first posterior cell broadly open in wing margin; medial crossvein at base of third posterior cell with a stump of a vein projecting into discal cell; posterior crossvein as long as r-m crossvein; second section of vein  $M_3 + Cu_1$  (fifth longitudinal vein) longer than first section; anal cell broadly open; axillary cell as wide as anal cell; alula but little developed. Abdominal dorsum with long thin black hair, tomentum whitish, that on middle of posterior margin of first segment, median crossband on second segment, median spot on third and middle of segments four and five with shiny black tomentum; side of abdomen from above with alternating white and black tufts to fifth segment, apical segments entirely black haired; lateral margin when viewed from side entirely black haired. Venter black pilose, brownish tomentose. Genitalia brown with black hair, posterior margin of epandrium concave below middle, apical corner rounded; epiphallus short, broad, rounded apically, slightly arched downward; aedeagus short and broad; basistylus long, narrow; dististyli narrow, sides parallel or nearly so, hooked apically.

**Female.** — Tomentum more abundant, black abdominal tomentum more or less confined to a median row of spots on segments two to five. Otherwise as described for the male.

The black or dark tomentum, because of its reflective nature, is rather difficult to describe. It reflects whitish when it is in reality brownish to black or will reflect dark when it is in reality light. Many specimens have the abdominal tomentum with violaceous reflections, in others the lateral dark hair appears violaceous. An occasional specimen is seen which has only two submarginal cells present in the wing.

**Holotype male, allotype female** from Riverside, Riverside County, California, IV-13-70 (J.C. Hall). In California Academy of Sciences, San Francisco.

**Paratypes:** California, Riverside Co.: 48♂♀ collected with types, 14♂, 9♀ topotypic, IV-3-70, V-2-70, IV-30-65, III-27-57, IV-10-59, III-2-55 (J.C. Hall, E.I. Schlinger); 3♂, 2♀ Box Canyon, III-21-67 (J.C. Hall); 2♂, 1♀ Berdoo Canyon, III-5-68 (J.C. Hall), on *Cryptantha*; 40♂, 4♀ Millard Canyon, IV-13-63, IV-7-74, (J.C. and E.M. Hall, E.I. Schlinger); 1♂ Whitewater, III-3-68 (E.M. Hall); 11♂, 5♀ Andreas Canyon, III-8-56 (J.C. Hall, P.H. Timberlake); 2♂, 2♀ Box Springs Canyon, IV-18-65 (P.A. Rauch); 3♀ Sunnymead, IV-16-65 (M.E. Irwin); 3♀ 7 mi. E. Sunnymead, V-9-64 (M.E. Irwin, P.A. Rauch); 13♀, 5♀ Deep Canyon, III-24-70, III-31-70, IV-14-73, III-28-63 (S.I. Frommer, L. LaPre, J.D. Pinto, M. Quillman, E.I. Schlinger). Kings Co.: 1♀ Avenal, III-6-53 (J.C. Hall). Inyo Co.: 1♂ Surprise Canyon, Panamint Mts., IV-24-57 (P.H. Timberlake). San Bernardino Co.: 1♂ 8 mi. N. Llano, IV-11-62 (J.C. Hall, E.I. Schlinger); 5 mi. W. Desert Springs, IV-11-62 (J.C. Hall, E.I. Schlinger); 1♂ Cima, IV-14-61 (W. Cronk).

### *Paradiplocampta*, n. gen.

This new genus may be located between *Diplocampta* and *Neodiplocampta* sharing characteristics of both genera except in the shape of the wing, the

configuration of the third antennal segment and male genitalia. In general *Paradiplocampta* is closest to the South American *Diplocampta* a relationship not too unexpected since other southern South American genera are found in the southeastern United States. The following diagnosis should serve to distinguish *Paradiplocampta* from all other Exoprosopinae:

Face conical but rounded apically. Eyes in male separated by width of ocellar tubercle. Basal antennal segments short, third segment elongate conical with minute terminal arista. Proboscis short not projecting. Upper portion of mesopleuron with a dense patch of scales. Fore tibiae without conspicuous bristles, mid and hind femora and tibiae with bristles; pulvilli wanting. Wing short and broad, about half as broad as long, widened apically; vein  $R_{2+3}$  double curved or strongly contorted; two submarginal cells; minute stumps of veins present at knee of vein  $R_{2+3}$  and  $R_4$ ; r-m crossvein before middle of discal cell; first posterior and anal cells broadly open in wing margin; axillary cell and alula well developed. Abdomen with short hair, not dense. Male genitalia small, epiphallus simple, short, broad with rounded apex; aedeagus short, slightly turned down, gonopore apical; dististyli curved posteriorly, hooked apically.

Genotype, *Paradiplocampta tabeti*, n. sp., monobasic.

At present this genus is known from the male sex only and is based on three specimens, one from southern California and two from southern Arizona. If the same relationship exists between the sexes as does that found in *Diplocampta* then the females may be difficult to distinguish from and separate from *Villa* (*Chrysanthrax*) or *Villa* (*Exhyalanthrax*), copulating pairs need to be collected and the females studied carefully. When females are discovered it is highly likely that the generic description will be emended.

### *Paradiplocampta tabeti*, n. sp.

**Male.** — Black. Eyes separated by width of ocellar tubercle. Front with black hair and pale yellow scales. First antennal segment twice length of second, second segment wider than long, both basal segments with black hair, third segment in lateral view with base conical, tapering to apical styliiform half or a little more. Face with black hair and pale yellow scales. Palpi black with black hair, about half length of proboscis. Occiput with white scales on upper half, a few pale yellow hairs and scales at vertex. Cervical fringe pale yellow above, black below. Mesonotum with short black hair, longer towards scutellum, collar and side in front of wing pale yellow; tomentum of pale yellow scales, a crossband of white in front of wing bases connecting tufts of white scales on mesopleura; bristles yellowish. Pleura black pilose, upper part of mesopleuron with yellow hair and white scales; metapleural tuft yellow, a few black hairs present at bottom of tuft. Prosternum, coxae and legs black pilose and tomentose; fore tibiae smooth otherwise bristles on legs black. Halter stem pale yellow, knob white. Squama light testaceous with fringe of white scales. Scutellum with short black hair, tomentum pale yellow, white on basal half; bristles black, not strong. Basicosta with a few light testaceous scales at base and black setulae overall; prealar hook broad, bare, pale. Wing hyaline, yellowish brown along costal margin, basal half of marginal cell and all of first basal cell; veins testaceous,



wing otherwise as described for genus. Abdominal dorsum with short black hair, white and longer at base; tomentum black, crossband of yellow scales at basal portion of second and fourth segments, a few yellow scales each side of middle on first segment; crossband of white scales on segments three and six, scattered white scales in middle of seventh segment; lateral margin black haired, pale yellow at base; venter black pilose and tomentose. Genitalia black with black hair; epandrium short, somewhat triangular in outline, apical corner a little projecting; epandrium short, broad, apex rounded, straight; aedeagus short, broad, bent downward apically; basal apodeme large; basistylus short, broad; dististylus short, bent outward, hooked apically.

**Female.** — Unknown.

**Holotype** male from 7 mi. E. of Portal, Cochise County, Arizona, VIII-29-67 (F.G. Andrews). In California Academy of Sciences, San Francisco.

**Paratypes:** 1♂ 5 mi. N. Portal, Cochise Co., Arizona, VIII-21-67 (E.I. Schlinger); 1♂ Deep Canyon, Trail from Hwy. 74, 2960-3680 ft., Riverside Co., California, IX-14-73 (A.B. Tabet).

The specimen from Deep Canyon differs from the Arizona specimens in that the wings are hyaline with only the costal cell yellowish and the yellowish scales on the second and fourth abdominal segments occupy most of the segment. There are also a few scattered yellowish scales on the upper part of the sternopleuron. Other than the above I can find no other differences between the two. Additional specimens may show the two to be distinct.

### *Parabombylius rutilous*, n. sp.

Separated from the congeners in the male by the bright orange pile on the upper half of the body and black pile on the lower half and a patch of silver white scales at the lateral margin of segments five to seven. In the female the bright orange pile on the entire body together with the silver patches of scales on each side of the first abdominal segment in addition to others should serve to distinguish this sex.

**Male.** = Dull black, pleural area of thorax lighter. Head and antennae black pilose, tomentum wanting except for small patch of yellowish scales opposite base of antennae next to eye. First antennal segment twice length of second, third segment longer than basal two combined, terminates in three small segments of equal length, apical one pointed. Proboscis projects ca. one and one half times head height beyond oral margin. Palpi short ca. one-eighth length of proboscis, with black hair. Occiput with orange hair on upper half, black below. Mesonotum orange pilose, a few scattered black hairs across anterior margin, in front of scutellum, on post-alar callus; tomentum wanting; bristles black. Pleura and legs entirely black pilose, femora with black tomentum; pulvilli half as long as claws. Halter stem and knob black. Squama black with fringe of black hair. Scutellum black pilose, a few scattered orange hairs mixed in; tomentum wanting, bristles black. Wing hyaline, first posterior cell closed slightly before apex; anal cell narrowly open. Abdominal dorsum orange pilose, black hair in middle of segments two

and three, across posterior margin of four and five and on all of six and seven; tomentum in the form of shiny white spots in middle of posterior margin of segments two to four, side of segments four, five, six entirely shiny white tomentose. Venter black pilose and tomentose.

**Female.** — Body entirely golden orange pilose and tomentose, a few black hairs on scutellum and across posterior margin of segments two to apex of abdomen. Shiny silver-white spots of tomentum each side of antennae, on humeral callus extending inward but not meeting along anterior margin of thorax then extending posteriorly for short distance, spot above root of wing, above post-alar callus, two small spots on disc and a larger spot in front of scutellum; silver-white spots at side of first abdominal segment, small mid-dorsal stripe on segments two to five, at side of fifth segment. Alular fringe silver-white. All femora with orange scales on dorsal surface. Tibiae testaceous. Otherwise as described for male.

**Holotype, allotype** and 19 **paratypes** from Gran Quivira, Torrance County, New Mexico, 6500 ft., VIII-20-67 (H.B. Leech). In California Academy of Sciences, San Francisco. Four paratypes in author's collection.

*Amphicosmus arizonicus*, n. sp.

Unlike any of the congeners by virtue of the infuscations on the wing and larger size, 7-8 mm.

**Female.** — Black with white and yellow markings. Front shining black, two yellow spots immediately above antennae, side next to eye narrowly argenteous to ocellar tubercle, short hair black. Ocellar tubercle located a little below vertex. Antennae black, first segment light testaceous on inner apex, basal segments nearly equal in length with black hair, second segment globular, third segment longer than two basal segments combined, linear, widest near the middle. Face white, shining black in middle above, with short, fine, yellowish hair on sides. Proboscis short, not projecting. Palpi brown with pale hair. Occiput, except shining black vertex, white. Cervical fringe of pale hair. Mesonotum shining black, humeral callus white, post-alar callus and spot in front of wing base yellow, hair short, scattered, pale; bristles wanting. Pleura white, middle of mesopleuron black extending to and including propleuron; lower portion of sterno- and pteropleurae black; metapleural hair pale; prosternum black. Coxae testaceous, dusky at base, legs yellow, trochanters with a black spot at apex, hind femur black on apical two-thirds, hind tibia and all tarsi black. Pulvilli as long as claws. Halter stem and knob pale yellow to white. Squama small, pale with fringe of pale hair. Scutellum shining yellow, posterior margin black, occasionally this extends into middle of scutellum, with short, scattered pale hair. Wing hyaline, brown band extends from near apex of subcostal vein posteriorly to base of third posterior cell crossing through r-m crossvein and middle of discal cell but leaving apex of discal hyaline, width of color decreases posteriorly; venation as described for genus. Abdominal dorsum shining black, posterior margin of all segments narrowly white, dorsum with short black hair, more noticeable towards apex. Venter white, side of each segment with elongate black mark making an interrupted black stripe down each side.

**Male.** — Unknown.

**Holotype** female and three **paratype** females from 6 mi. E. of Patagonia, Santa Cruz County, Arizona, IX-17-71 (J.L. Bath). Type in California Academy of Science, San Francisco.